

**FUTURE FISHERIES IMPROVEMENT PROGRAM  
GRANT APPLICATION***(please fill in the highlighted areas)***I. APPLICANT INFORMATION**A. Applicant Name: Big Blackfoot Chapter of Trout UnlimitedB. Mailing Address: PO Box 1C. City: Ovando State: MT Zip: 59854Telephone: 406-240-4824D. Contact Person: Ryen Neudecker

Address if different from Applicant: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_

E. Landowner and/or Lessee Name  
(if other than Applicant): Gary & Sharon JacobsenMailing Address: 4852 HWY 200City: Ovando State: MT Zip: 59854Telephone: 406.793.5686**II. PROJECT INFORMATION\***A. Project Name: West Fork Jacobsen Spring Creek Restoration ProjectRiver, stream, or lake: West Fork Jacobsen Spring CreekLocation: Township 14N Range 12W Section 10County: Powell

B. Purpose of Project:

Restore a high quality spring creek capable of self-maintaining complex habitat suitable to all salmonids in the North Fork Blackfoot River, including bull trout.

C. Brief Project Description: \_\_\_\_\_

West Fork Jacobsen Spring Creek is a small tributary to Jacobsen Spring Creek which feeds the North Fork of the Blackfoot River. The North Fork is a primary fluvial bull trout spawning tributary and "core area" for the recovery of the species and the spring creek is a historical bull trout and westslope cutthroat stream. The entire length of Jacobsen Spring Creek (19,000 ft) was restored in 2006-2008 and the system has responded with improved spawning and rearing habitat and decreased water temperatures. The primary objective of the West Fork Jacobsen Spring Creek project is to create a stable stream system with the habitat diversity necessary to support a self-sustaining high quality trout fishery as it is currently in a degraded condition. Within this reach the channel is significantly wider and shallower than what an ideal reference condition would look like. The West Fork Jacobsen Creek currently occupies a 20-50 ft. wide swale; the majority of the stream is uncontained with a high width / depth ratio and resembles a pond more than a stream with water extending the width of the swale. The channel in the project area has some remnant stream banks, but they are discontinuous, resulting in a braided stream. West Fork Jacobsen Creek has been impacted by hoof shear that hinders woody vegetation development that would provide bank stability and shading. Three undersized culverts used for irrigation pivot crossings cause back water ponding issues that further impact water temperature and stream flow.

The project would restore the stream channel to a more natural dimension, pattern and profile utilizing natural channel design bank and in-stream techniques and treatments by restoring ~ 1,500 feet of channel. The restored channel system would be self-maintaining in terms of maintaining channel integrity, and sediment transport. Native riparian vegetation including sedges, shrubs and trees would be established along constructed stream banks. A defined stream channel will also help mitigate stream temperatures in West Fork Jacobsen Creek, Jacobsen Creek and North Fork Blackfoot River. Three undersized stream crossings would also be upgraded (one with a larger culvert, two with pivot crossings) to accommodate channel function, fish passage and ranch maintenance needs. A grazing management plan would also be incorporated and involves excluding the riparian area.

D. Length of stream or size of lake that will be treated:

1,500 feet of West Fork Jacobsen Spring Creek would be restored.

E. Project Budget:

**Grant Request (Dollars):** \$ **7,500**

Contribution by Applicant (Dollars): \$ In-kind \$ 4,450  
(salaries of government employees are not considered as matching contributions)

Contribution from other Sources (Dollars): \$ 21,500 In-kind \$  
(attach verification - See page 2 budget template)

**Total Project Cost:** \$ **38,200**

F. Attach itemized (line item) budget – see template

G. Attach specific project plans, detailed sketches, plan views, photographs, maps, evidence of landowner consent, evidence of public support, and/or other information necessary to evaluate the merits of the project. If project involves water leasing or water salvage complete supplemental questionnaire ([fwp.mt.gov/habitat/futurefisheries/supplement2.doc](http://fwp.mt.gov/habitat/futurefisheries/supplement2.doc)).

H. Attach land management and maintenance plans that will ensure protection of the reclaimed area.

### III. PROJECT BENEFITS\*

A. What species of fish will benefit from this project?:

All salmonids currently occupying Jacobsen Spring Creek (rainbow trout, brown trout and brook trout). We expect increased use from native species (westslope cutthroat trout and bull trout) as habitat conditions improve.

B. How will the project protect or enhance wild fish habitat?:

This project will complete restoration of important spring creek habitat on a large ranch protected with a conservation easement. West Fork Jacobson Spring Creek currently lacks sufficient spawning and rearing habitat, but has potential to these functions once restored to its proper pattern, profile and channel dimensions. Instream benefits will also be realized to the North Fork Blackfoot with the temperature moderating effects. Monitoring of our earlier work has shown at least a 10-degree decline in temperatures.

C. Will the project improve fish populations and/or fishing? To what extent?:

Yes, by providing off-site recruitment to the North Fork and angling opportunities on-site. The spring creek enters a portion of the North Fork that receives high angling pressure.

D. Will the project increase public fishing opportunity for wild fish and, if so, how?:

Yes, by increasing wild trout habitat in the North Fork Blackfoot River drainage.

E. If the project requires maintenance, what is your time commitment to this project?:

BBCTU will monitor riparian vegetation and grazing management response and work with the landowners to ensure the project is implemented successfully. The landowners have committed to signing a 20-year agreement to maintain the improvements and protect the integrity of the riparian area once the project is completed.

F. What was the cause of habitat degradation in the area of this project and how will the project correct the cause?:

Already answered.

G. What public benefits will be realized from this project?:

This project involves the continuation of the Blackfoot River Restoration program and the restoration of a bull trout core area stream. Public benefits include: 1) recruitment of recreational fisheries to the North Fork, 2) increasing the amount of fishable water, 3) improved water quality (temperature and sediment reductions) on-site and downstream, and 4) contribute to the recovery of bull trout and delisting of bull trout from the ESA.

H. Will the project interfere with water or property rights of adjacent landowners? (explain):

No.

I. Will the project result in the development of commercial recreational use on the site?: (explain):

No

J. Is this project associated with the reclamation of past mining activity?:

No

**Each approved project sponsor must enter into a written agreement with the Department specifying terms and duration of the project.**

#### **IV. AUTHORIZING STATEMENT**

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature:

*Ryan Neudecker*

Date:

11-25-14

Sponsor (if applicable):

**\*Highlighted boxes will automatically expand.**

**Mail To:**

**Montana Fish, Wildlife & Parks  
Habitat Protection Bureau  
PO Box 200701  
Helena, MT 59620-0701**

**Incomplete or late applications will be returned to applicant.**

**Applications may be rejected if this form is modified.**

**\*\*\*Applications may be submitted at anytime, but must be received by the Future Fisheries Program office in Helena before December 1 and June 1 of each year to be considered for the subsequent funding period.\*\*\***

WORK ITEMS (ITEMIZE BY CATEGORY)	NUMBER OF UNITS	UNIT DESCRIPTION*	COST/UNIT	TOTAL COST	CONTRIBUTIONS			
					FISHERIES REQUEST	IN-KIND SERVICES	IN-KIND CASH	TOTAL
<b>Personnel</b>								
Survey	10	hours	\$90.00	\$ 900.00		1,250.00 1,200.00	\$ 900.00	\$ 900.00
Design	50	hours	\$85.00	\$ 4,250.00			\$ 4,250.00	\$ 4,250.00
Permitting	25	hours	\$50.00	\$ 1,250.00				\$ 1,250.00
Oversight	60	hours	\$70.00	\$ 4,200.00			\$ 3,000.00	\$ 4,200.00
Labor	20	hours	\$50.00	\$ 1,000.00			1,000.00	\$ 1,000.00
<b>Construction Materials</b>								
Trees (4-8" diameter)	30	each	\$25.00	\$ 750.00		750.00		\$ 750.00
Sod mats	2000	LF	\$2.00	\$ 4,000.00		4,000.00		\$ 4,000.00
Squash Pipe	1	each	\$2,000.00	\$ 2,000.00			2,000.00	\$ 2,000.00
Pivot Bridges	2	each	\$500.00	\$1,000			1,000.00	\$1,000
Willow cuttings	2000	each	\$1.00	\$ 2,000.00	1,000.00		1,000.00	\$ 2,000.00
3-strand fence	1500	ft	\$1.50	\$ 2,250.00			2,250.00	\$ 2,250.00
<b>Equipment</b>								
Hydraulic Excavator	60	hours	\$140.00	\$ 8,400.00	4,000.00		4,400.00	\$ 8,400.00
Track Truck	20	hours	\$125.00	\$ 2,500.00	1,500.00		1,000.00	\$ 2,500.00
Skidsteer	30	hours	\$90.00	\$ 2,700.00	1,000.00		1,700.00	\$ 2,700.00
<b>Mobilization</b>								
Mob/demob	1	lump sum	\$3,000.00	\$ 1,000.00			1,000.00	\$ 1,000.00
				\$ -				\$ -
TOTALS				\$ 38,200.00	\$ 7,500.00	\$ 7,200.00	\$ 23,500.00	\$ 38,200.00

\*Units = feet, hours, inches, lump sum, etc.

## MATCHING CONTRIBUTIONS

	0	IN-KIND SERVICE	IN-KIND CASH	TOTAL
USFWS Partners for Fish & Wildlife		\$ -	\$ 10,000.00	\$ 10,000.00
Landowner		\$ 4,750.00		\$ 4,750.00
Trout & Salmon Foundation			\$ 1,500.00	\$ 1,500.00
Chutney Foundation			\$ 10,000.00	\$ 10,000.00
BBCTU		\$ 4,450.00		\$ 4,450.00





Photo 1: Example of existing condition on West Fork Jacobsen Spring Creek.



# West Fork Jacobson Jacobsen Creek Restoration and Habitat Enhancement



Prepared by:



*WestWater Consultants, Inc.*

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## **West Fork Jacobsen Creek Restoration and Habitat Enhancement**

West Fork Jacobsen Spring Creek is a small tributary to Jacobsen Spring Creek which feeds the North Fork of the Blackfoot River. The North Fork is a primary fluvial bull trout spawning tributary and “core area” for the recovery of the species and the spring creek is a historical bull trout and westslope cutthroat stream. The entire length of Jacobsen Spring Creek (19,000 ft) was restored in 2006-2008 and the system has responded with improved spawning and rearing habitat and decreased water temperatures. Appendix A includes a general vicinity map and project area map.

The primary objective of the West Fork Jacobsen Spring Creek project is to create a stable stream system with the habitat diversity necessary to support a self-sustaining high quality trout fishery. A defined stream channel will also help mitigate stream temperatures in West Fork Jacobsen Creek, Jacobsen Creek and North Fork Blackfoot River. The project would provide diverse habitat for many age-classes of salmonids which may include spawning and rearing habitat. Currently, West Fork Jacobsen Spring Creek is in a degraded condition. The project would restore the stream channel to a more natural dimension, pattern and profile utilizing natural channel design bank and in-stream techniques and treatments. The restored channel system would be self-maintaining in terms of maintaining channel integrity, and sediment transport. Native riparian vegetation including sedges, shrubs and trees would be established along constructed stream banks. The stream corridor would also provide habitat for riparian dependent species through the design of associated off-channel habitat.

### **Existing Condition**

West Fork Jacobsen Creek is a spring creek that emerges south of highway 200 and flows into the main branch of Jacobsen Creek. Restoration of the West Fork will complete a restoration effort on the Jacobsen Ranch that began in 2005. Based on field survey data and observations, it is evident that West Fork Jacobsen Spring Creek has been impacted by past land management activities. West Fork Jacobsen Creek is approximately 850 ft. in length and lacks in-stream habitat diversity. Within this reach the channel is significantly wider and shallower than what an ideal reference condition would look like. The West Fork Jacobsen Creek currently occupies a 20-50 ft. wide swale; the majority of the stream is uncontained with a high width / depth ratio and resembles a pond more than a stream with water extending the width of the swale (see photograph 1, below). The channel in the project area has some remnant stream banks, but they are discontinuous, resulting in a braided stream. West Fork Jacobsen Creek has been impacted by hoof shear that hinders woody vegetation development that would provide bank stability and shading. Three undersized culverts that are used for an irrigation pivot crossing cause back water ponding issues that further impact water temperature and stream flow (photograph 2). Stream flow is most noticeable at the culvert locations due to the water converging into the pipe.





Photograph 1 above shows West Fork Jacobsen Creek undefined channel and existing swale.  
Below photograph 2 shows example of pivot crossing causing back water conditions.



Reed canary grass is present in the project area and results in reduced channel capacity causing stream flows to overtop the channel and flood an adjacent pasture. These areas have been identified for treatment during construction.

### **Proposed Restoration Treatments**

West Fork Jacobsen Spring Creek is classified as an E4 channel type (Rosgen, 1996). E4 channel types are typically characterized as riffle-pool streams that are low gradient and highly sinuous, with low width to depth ratios and flanked by a floodplain accessible during high flows. This pattern is largely absent in the restoration reach.

Based on the initial channel survey, channel and bank restoration treatments would include:

- increasing channel sinuosity to provide additional channel habitat diversity
- converting the stream to a more typical riffle/pool sequence
- modifying over-widened sections with appropriate channel width and depth dimensions
- improving habitat diversity including off-channel habitat
- re-establishing bank margins, constructed banks and floodplain with native riparian vegetation

The proposed channel will utilize riparian sod to build stream banks within the swale the stream presently occupies. If needed, gravel will be used for a base to stack sod onto. Construction of the stream banks will use bank features called “finger bars”. Finger bars consist of alluvial material that is topped with a sod mat constructed to narrow the channel. Depending on the site, the area behind the banks may not be filled but rather an open backwater or “off-channel” habitat area would be created. These off-channel areas may be open to the main channel and provide rearing areas for juvenile fish and waterfowl habitat. Where additional fill is needed for constructing the banks off-channel habitat areas may be excavated. Examples of finger bars and back water bays are located in Appendix B. Small pieces of woody debris (brush and small branches) will be incorporated into banks, specifically outside bends near pools to provide diverse habitat and cover for salmonids.

Restoration of the West Fork Jacobsen Spring Creek incorporates a combination of channel modifications, engineering and bioengineering treatments. All treatments are within the natural channel design concept with the objective of restoring channel function while enhancing habitat diversity and quality.

The sinuosity pattern of West Fork Jacobsen Spring Creek would be increased by realigning the channel pattern and dimensions throughout the project area. The natural sequence of the riffle-pool channel features would be re-established. Long, deep pools would be constructed along the outside bend of meanders. At the terminus of the pool the channel bed would ascend forming the pool tailout. A steeper riffle and run downstream from the tailout crest would transition into the pool at the next meander. There would be a net increase in channel length of over 600 feet with the design alignment and channel narrowing of the existing swale. The proposed channel alignment and proposed cross sections are illustrated in Appendix A. To minimize impacts, channel alignment will utilize as many existing features and stable vegetation as possible.

Table 1: Summary of existing and design channel dimensions and pattern

	Existing Channel				Design Channel		
	Width	Mean Depth	W/D Ratio		Width	Mean Depth	W/D Ratio
Riffle	20'-50'	.3-1.0'	20-50		2'-3'	.6-.8'	5-9
						Max. Depth	
Pool	20' – 50'	1.5' -2'			2.5-3	1.5-2.5	
	Existing			Design			
Sinuosity	1.1			1.5-1.9			
Radius curv.	n/a			12-20'			
Meander L				40-60'			

Since there are very few existing channel features, channel excavation will be associated with creating pools along the outer banks of meanders and construction of stream bank. Where feasible the bends and pools would be located adjacent to existing mature shrubs or existing sod mats to maximize bank stability. The material excavated during the channel shaping would be utilized for constructing the banks primarily on the inside of the meanders; some of the material may be used to construct the berm adjacent to the pasture on the main stem Jacobsen Creek, if it is free of canary grass.

West Fork Jacobsen Creek has three wheel crossings for an irrigation pivot line. All of these crossings are partially plugged or collapsed causing back water and ponding. The two upstream crossings will be replaced with bridges similar to those used on the main stem Jacobsen Creek and will span the stream. The third crossing is used for machinery access; this crossing will be replaced with a three-foot diameter squash pipe. Photograph three below shows an example of a pivot crossing that was installed on lower Jacobsen Spring Creek. The new structure does not hinder stream function or fish passage and meets irrigator objectives as well.





During construction of the West Fork channel, reed canary grass will not be utilized for any bank construction. Reed canary will be removed from the channel as much as possible; if it is not possible to remove it will be submerged and buried with substrate within the construction area in order to drown it. Reed canary grass will also be removed from the main stem of Jacobsen Creek near the areas that are shown on the planview in Appendix B, the grass is causing flooding of an adjacent pasture by reducing the cross sectional area of the channel. Removed canary reed grass will be placed in an upland area to dry out. The flooding is causing problems during haying operation keeping the ground saturated even when irrigation has been shut off. A low berm will be installed along the existing fence line in the areas of overflow for Jacobsen Creek to help eliminate pasture saturation from channel overflow. Approximate locations for the berms installation are also located in Appendix B.

### **Vegetation Plan**

The establishment of a native plant community is critical to the long-term stability of the channel, habitat quality and sustained fishery. The proposed treatments include the re-vegetation of disturbed areas throughout the project area. Included will be seeding with native grasses and forb species, placing sod mats and shrub transplants on constructed stream banks and incorporating willow cuttings.

### **Best Management Practices (BMPs)**

Best Management Practices or BMPs will be designed and implemented to minimize the unavoidable on-site and off-site impacts associated with ground disturbing activities. Impacts will include temporary increases in turbidity and sedimentation. WWC strives to minimize impacts and has developed a package of BMP treatments. BMPs will be implemented as



needed to minimize potential impacts and include localized channel diversions around construction sites, settling ponds, pumping, timing and sequencing of construction activities, etc.

### **Proposed Project Schedule**

Construction is tentatively scheduled to commence in July or August of 2015 and will require approximately 3 weeks to complete. The final schedule is dependent on several variables including when the necessary permits are issued, mandated construction windows, contractor availability, etc.

<b>The proposed schedule is as follows: Project Schedule</b>	
Detailed Channel Survey	Completed
Analyze Data and Design	Completed
Permit Submittal	Winter 2014
Project Layout and stakeholder review	Summer 2015
Construction	Summer 2015

## **West Fork Jacobsen Spring Creek Restoration**

### **Appendix A**

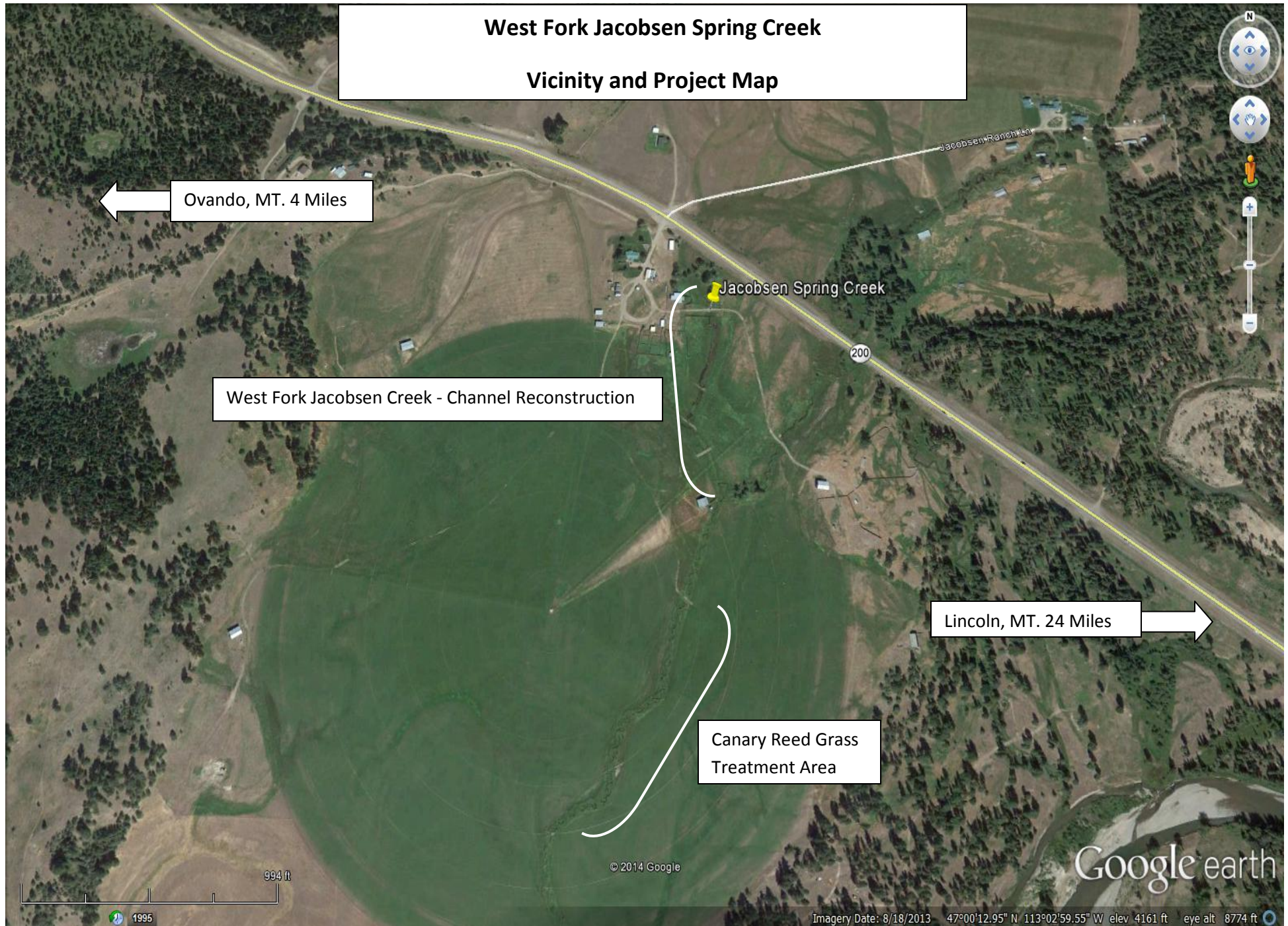
Project site and Vicinity Planview

Proposed Stream Alignment

Existing and Proposed Channel Cross Sections (2)

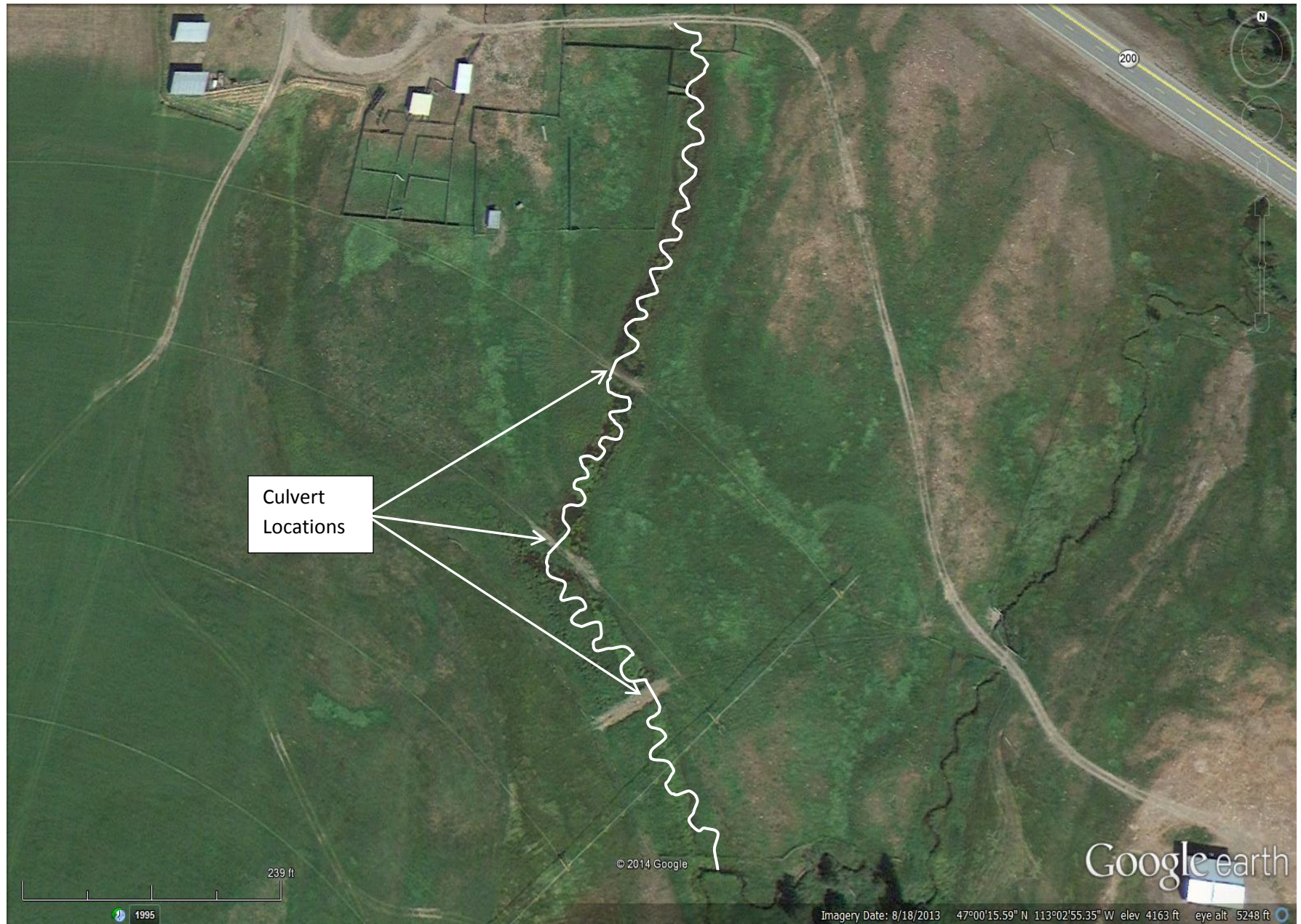
Existing Longitudinal Profile and Proposed Bankfull

Finger Bar Illustration

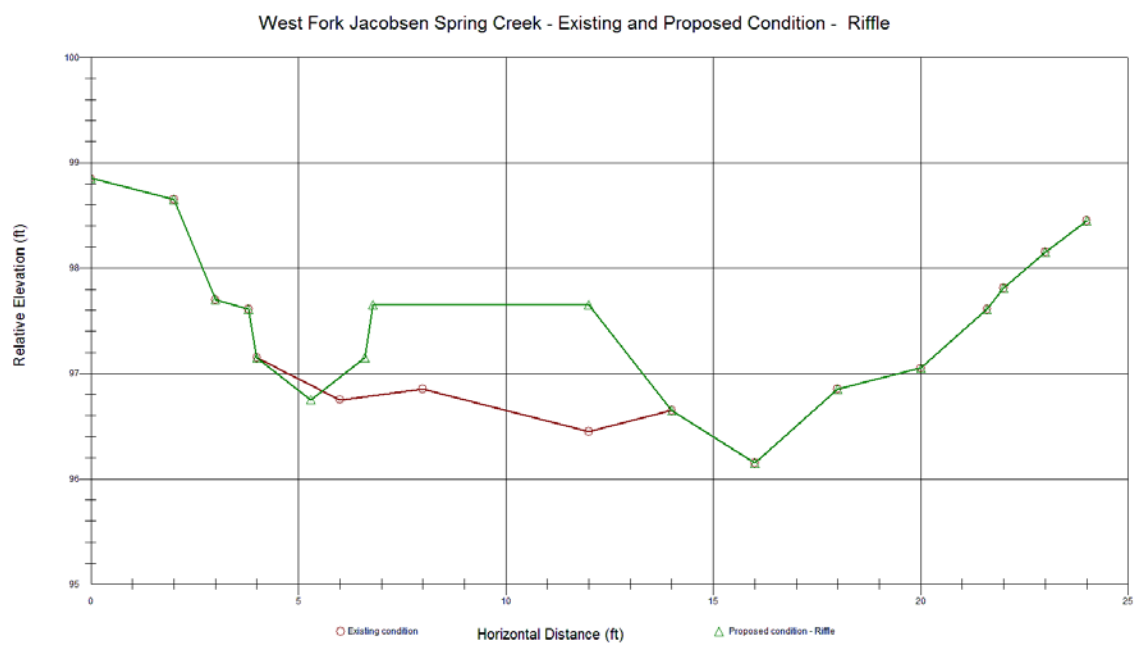


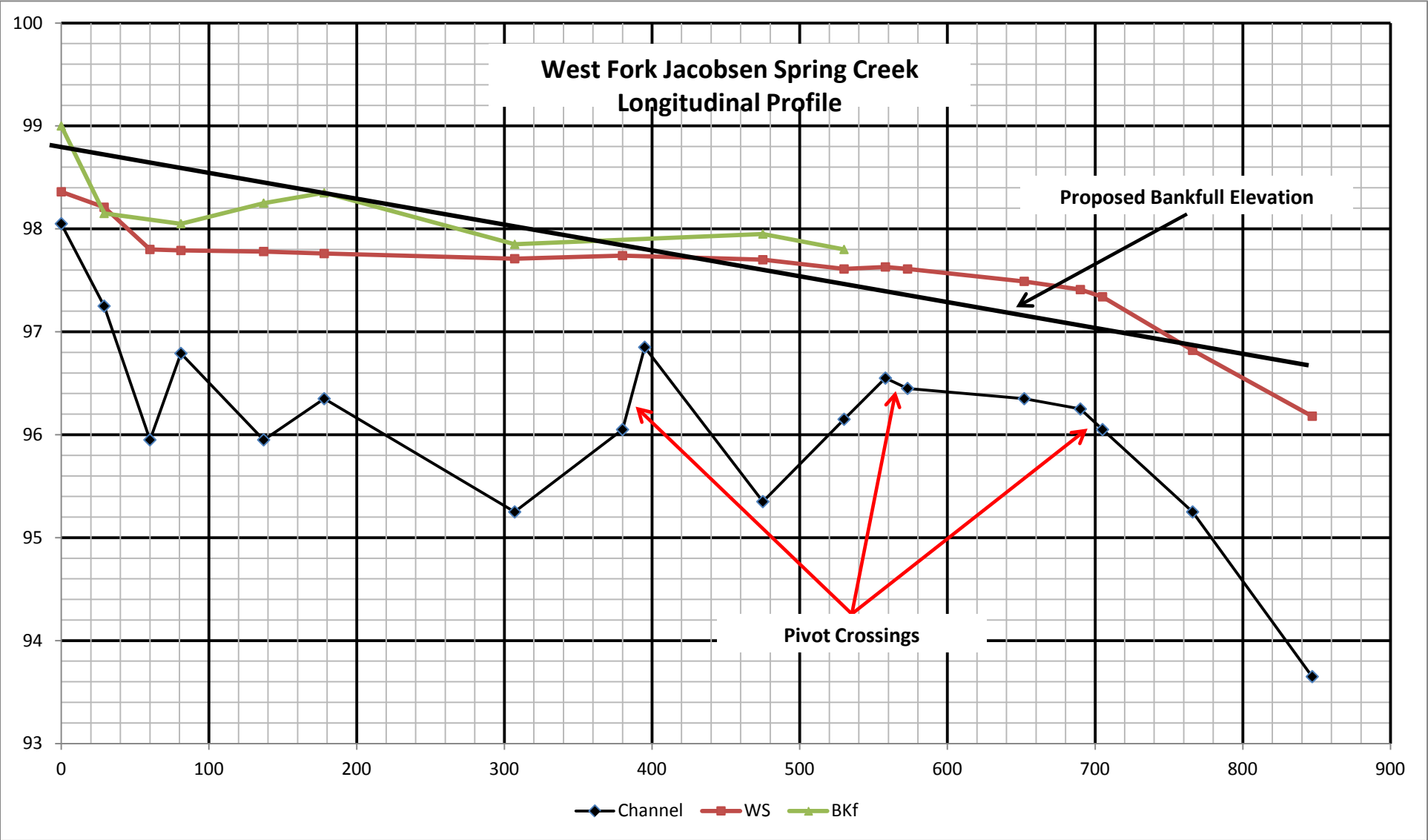


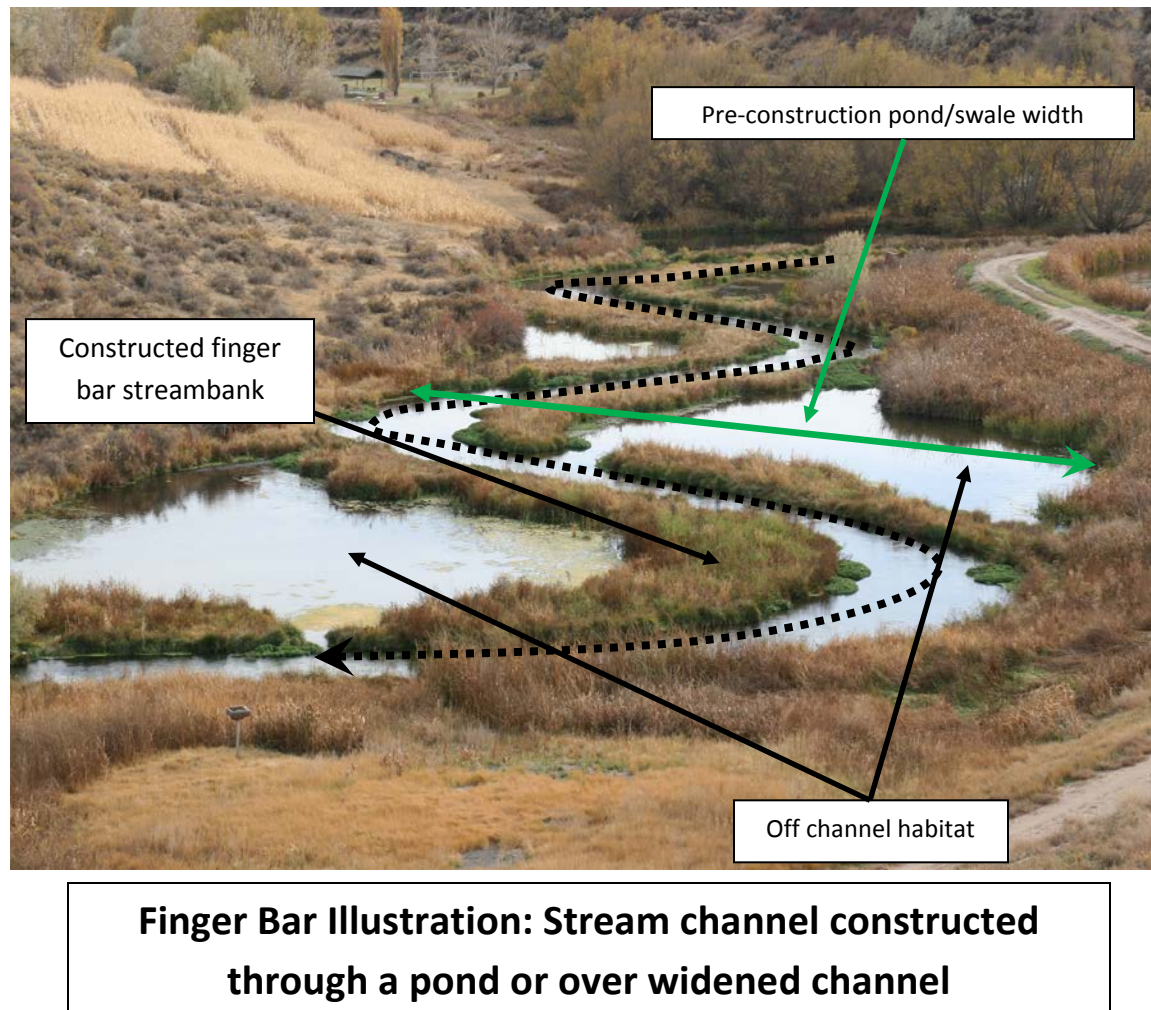
# West Fork Jacobsen Spring Creek – Proposed Stream Alignment











Finger bars are used for constructing streams through areas that are over widened or in existing ponds. Finger bar construction creates a stream channel that is able to move sediment through the system rather than deposit sediment in the over widened channel or pond. Finger bars minimize construction time and material amounts normally used to fill the floodplain. Large areas may be left as open water, creating off channel habitat. The off channel habitat created is utilized by waterfowl as well as refugia by small fish. Riparian plant cuttings and/or rooted riparian species may be grown on finger bars to provide shade and overhead cover.

**To:** Michelle McGree

**From:** Ron Pierce, Fisheries Biologist Blackfoot River Basin

**Date:** 11-26-2014

**Subject:** Future Fisheries Applications

In addition to writing the Douglas Creek FF application, I've reviewed five TU-related Future Fisheries application from my work area. These five projects include three on the USFS lands (Theodore Creek, Yukon Creek, Stonewall Creek), one project in cooperation with the University of Montana (Shanley Creek), and one found entirely on private land (West Fork of Jacobsen Creek). From my review, all projects are worthy of support; all have some native fish value.

The FS projects are important because they represent an ongoing broad-level effort to correct road impacts at regional scale of the upper Blackfoot Basin. These are legacy projects that should specifically benefit westslope cutthroat trout. The Shanley Creek project is an opportunity to correct lingering riparian/fisheries issues on the U of M Bandy Ranch. The West Fork of Jacobsen Creek should complete stream restoration work on that property.

Please let me know if you have any questions.